REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 2-17 and 29-32 are in the case.

I. ELECTION/RESTRICTION

The election of Group II is hereby affirmed. Claims 1 and 16-28 have been cancelled without prejudice to pursuing that subject matter in a separate divisional application.

II. THE ANTICIPATION REJECTIONS

Claims 2-15 and 29 stand rejected under 35 U.S.C. §102(a) as allegedly anticipated by Janscak et al (1998). Claims 2, 3, 7-12, 29 and 30 stand rejected under 35 U.S.C. §102(b) as allegedly anticipated by Yin et al. Claims 2-4, 6-13, 15 and 29 stand rejected under 35 U.S.C. §102(b) as allegedly anticipated by Janscak et al (1996). Claims 2-15 and 29 stand rejected under 35 U.S.C. §102(b) as allegedly anticipated by Mernagh et al. Those rejections are respectfully traversed.

Without conceding to the merit of the outstanding rejections, claim 2 has been amended to further distinguish the claimed invention from the cited prior art, by specifically reciting that the enzyme remains fixed to the nucleic acid at the original binding site throughout translocation. Thus, as now claimed in claim 2, the molecular motor system comprises a nucleic acid sequence having bound thereto (1) at a first, proximal, region of the nucleic acid, a translocating enzyme for translocating the nucleic acid sequence, the enzyme remaining bound to the proximal region of the nucleic acid,

as a complex therewith, during translocation; and (2) at a second, distal, region of the nucleic acid, a bound substance capable of remaining bound to the nucleic acid sequence during translocation, whereby the bound substance becomes translocated, relative to the region of binding of the enzyme to the nucleic acid sequence, as a result of the translocation of the nucleic acid to which it is bound. The enzyme remains fixed to the nucleic acid at the original binding site throughout translocation, and the system operating in a manner such that cleavage of the nucleic acid does not occur. Basis appears in the original claim 2 and in the first paragraph of page 8 of the originally-filed specification. Similar amendments have been made to independent claim 12. No new matter is entered.

The assertion by the Examiner on page 3 of the action that in Janscak "The Mtase is the second bound substance..." is respectfully traversed. In order to have motor capability, the enzyme **must** be a coherent complex, and will not work if the sub-units are not complexed together. Hence, the Mtase and the HsdR sub-unit cannot be separated as "enzyme" and "bound substance", respectively or *vice versa.* Janscak is therefore not anticipatory of the presently claimed invention.

The remaining cited art likewise does not anticipate (or render obvious) the presently claimed invention. As noted earlier in prosecution of this case, Janscak (1996), which is the earliest paper by Dr. Firman and his co-workers on this project, inaccurately reports the stoichiometry of the Type IC R-M enzymes studied. The stoichiometry of $R_1M_2S_1$ for the endonuclease suggested on page 980 of Janscak 1996 was later shown to be incorrect and is reported as such in Janscak 1998 and Mernagh (See Janscak 1965 at page 4439, right hand column: "The stoichiometry of this

endonuclease preparation appeared to be $R_1M_2S_1$" (emphasis added), and page 4440, first complete paragraph, first sentence: "In this paper we show that the purified EcoR124I restriction endonuclease is a mixture of two species, which have a sub-unit stoichiometry of $R_2M_2S_1$ and $R_1M_2S_1$, respectively. "See Mernagh, page 497, right hand column: "the EcoR124I endonuclease has been reported to exist in the form R_1M_2S ...", and page 498, right hand column: "The SPR results are consistent with the formation of both R_1M_2S and R_2M_2S in a concentration dependant manner".) Also, the predicted stoichiometry of $R_1M_2S_1$ on page 980 of Janscak 1996 was suggested for the native enzyme, which is known to cleave DNA. There is no disclosure in the cited art of the R_1M_2S species being harnessed to do useful work as a molecular motor.

It is now known that the native enzyme is an equilibrium mixture of the R_1- and R_2- species and, as such, will always be able to cleave DNA. Use of the native enzyme therefore falls outside the scope of the present claims.

Yin et al discloses a molecular motor which operates in a different way from the molecular motor of the present invention. Figure 1 on page 1654 of Yin et al illustrates a molecular motor typical of prior art systems. In particular, with reference to views (A) and (B), it can be seen that the enzyme (RNA polymerase) travels along the DNA, bringing the distal end closer to the polymerase binding site, but allowing the original binding site to recede in the opposite direction.

By contrast, the molecular motor according to the claimed invention remains fixed to the nucleic acid at the (original) binding site. When the motor is activated, the distal end of the nucleic acid is brought closer to the binding site, but there is no movement of the proximal end of the nucleic acid relative to the enzyme.

In light of the above, it is clear that none of the cited references anticipates the presently claimed invention. Reconsideration and withdrawal of all of the outstanding anticipation rejections are accordingly respectfully requested.

III. THE 35 U.S.C. 112, FIRST PARAGRAPH, REJECTION

Claims 31 and 32 stand rejected under 35 U.S.C. 112, first paragraph, on alleged failure to comply with the written description requirement. That rejection is respectfully traversed.

Claims 31 and 32 were derived from original claim 10 which was rejected on alleged indefiniteness grounds in the action mailed August 26, 2003. Claim 10 in turn was based on page 13, line 11 through to page 14, line 14 which stated that:

(a) the bound substance may be the actual material that it is intended to translocate; or

(b) the bound substance may be a means for binding the actual material that it is intended to translocate; or

(c) the bound substance may be the means for binding the material that it is intended to translocate in combination with the material that it is intended to translocate.

Based on the above, claim 30 has been clarified by stating that the substance which is required to be translated is defined as the "material": Similar amendments have been made to claims 7, 10, 11, 31 and 32, and the word "linker" no longer appears in claims 31 and 32. Basis for the word "material" appears in line 1 of page 14. No new matter is entered.

Withdrawal of the 35 U.S.C. 112, first paragraph, rejection of 31 and 32 is now believed to be in order. Such action is respectfully requested.

IV. THE 35 U.S.C. 112, SECOND PARAGRAPH, REJECTION

Claims 2-15 and 29-32 stand rejected under 35 U.S.C. 112, second paragraph, as allegedly indefinite. In response and without conceding to the merit of this rejection, claim 2 has been amended (as noted above) to make it clear that the enzyme remains fixed to the nucleic acid at the original binding site throughout translocation, and the system operating in a manner such that cleavage of the nucleic acid does not occur. Basis appears in the original claims 2 and 12 and in the first paragraph of page 8 of the originally-filed specification. Similar amendments have been made to independent claim 12. No new matter is entered. Withdrawal of the 35 USC 112, second paragraph rejection, is respectfully requested.

IV. THE OBVIOUSNESS REJECTION

Claims 31 and 32 stand rejected under 35 U.S.C. 103(a) as allegedly unpatentable over Yin in view of Huang. In response, claims 31 and 32 are each dependent indirectly on claim 2 and thereby incorporate the features of amended claim 2, which is not anticipated or suggested by Yin for the above-discussed reasons. Huang is cited as allegedly disclosing a method of binding double stranded DNA molecules to streptavidin coated beads. Huang clearly does not cure the deficiencies of Yin and thus fails to generate a prima facie case of obviousness against claims 31 and 32. One of ordinary skill would not therefore have been motivated to combine Yin and

Huang as suggested by the Examiner. Withdrawal of the obviousness rejection is respectfully requested.

Allowance of the application is awaited.

Respectfully submitted,

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